Datalogic Formula™

User's Manual

✪DATALOGIC™

Datalogic Mobile S.r.l.
Via S. Vitalino 13
40012 - Lippo di Calderara di Reno
Bologna - Italy

Formula™ - User's Manual

Ed.: 12/2008

CONTENTS

REFERENCES

CONVENTIONS

This manual uses the following conventions:

"User" refers to anyone using a Formula™ mobile computer.
"Mobile computer" and "Formula™" refer to Formula™ mobile computer.
"You" refers to the System Administrator or Technical Support person using this manual to install, configure, operate, maintain or troubleshoot a Formula™ mobile computer.

REFERENCE DOCUMENTATION

For further information regarding Formula™ refer to the Formula™ SwTools CD.

SERVICES AND SUPPORT

Datalogic provides several services as well as technical support through its website.
Log on to **www.mobile.datalogic.com** and click on the links indicated for further information including:

- **PRODUCTS**

    Search through the links to arrive at your product page where you can download specific **Manuals** and **Software & Utilities**

- **SERVICES & SUPPORT**

    - **Datalogic Services** Warranty Extensions and Maintenance Agreements

    - **Authorised Repair Centres**

- **CONTACT US**

    E-mail form and listing of Datalogic Subsidiaries

SAFETY REGULATIONS

NOTE	*Read this manual carefully before performing any type of connection to the Formula™ mobile computer.* *The user is responsible for any damages caused by incorrect use of the equipment or by inobservance of the indication supplied in this manual.*

GENERAL SAFETY RULES

− Use only the components supplied by the manufacturer for the specific Formula™ being used.

− Do not attempt to disassemble the Formula™ mobile computer, as it does not contain parts that can be repaired by the user. Any tampering will invalidate the warranty.

− When replacing the battery pack or at the end of the operative life of the Formula™ mobile computer, disposal must be performed in compliance with the laws in force.

− Before using the device and the battery pack, see par. 4.3 and read every warnings about the device and the battery pack.

− Do not submerge the Formula™ in liquid products.

− The Datalogic Formula™ is designed and labelled to be compliant with laws, rules and regulations in force in the countries where it is sold.

− For further information, refer to this manual and to the Datalogic Mobile web site: www.mobile.datalogic.com.

BLUETOOTH® APPROVAL

This product is equipped with the following certified Bluetooth module:

Bluetooth QD ID B011904.

POWER SUPPLY

This device is intended to be connected to a UL Listed/CSA Certified computer which supplies power directly to the reader or else be supplied by a UL Listed/CSA Certified Power Unit marked "Class 2" or LPS power source rated 5 V, minimum 3.0 A, which supplies power directly to the reader via the power connector of the cable.

The package includes a EU plug adapter. The EU adapter must be plugged in the power supply before the power supply itself is plugged on the wall outlet.

LASER SAFETY

The laser light is visible to the human eye and is emitted from the window indicated in the figure.

Laser output window

AVOID EXPOSURE
LASER LIGHT
IS EMITTED FROM
THIS APERTURE

This product complies with 21 CFR Subchapter J
CAUTION-CLASS 2 LASER LIGHT WHEN OPEN - DO NOT STARE INTO BEAM

LASER LIGHT - DO NOT STARE INTO BEAM
CLASS 2 LASER PRODUCT
MAX. OUTPUT RADIATION 2 mW
EMITTED WAVELENGTH 630~680 nm
EN60825-1:2001

S/N: P07G00001
Mod:DL-FORMULA laser
Manufactured: July 2007
Datalogic Mobile S.r.l, via S. Vitalino 13
- 40012, Calderara di Reno (BO) - Italy.
Made in Taiwan
This product is covered by one or
more of the following patents.
Design Pat. AU 310182 S; CN 658612;
HK 0601962.6; KR 30-0466667; TW D118829.
US Pat. 5,992,740.European Pat. 789,315 B1.
Additional patents pending.
Contains FCC ID: RFR-B2029
This device complies with Part 15 of the FCC Rules.
Operation is subject to the following two conditions :
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received,
including interference that may cause undesired
operation.

backup battery

N2468
Input:5 Vdc 1A

I	D	F	E
La luce laser è visibile all'occhio umano e viene emessa dalla finestra indicata nella figura.	Die Laserstrahlung ist für das menschliche Auge sichtbar und wird am Strahlaustrittsfenster ausgesendet (siehe Bild).	Le rayon laser est visible à l'oeil nu et il est émis par la fenêtre désignée sur l'illustration dans la figure.	La luz láser es visible al ojo humano y es emitida por la ventana indicada en la figura.
LUCE LASER NON FISSARE IL FASCIO APPARECCHIO LASER DI CLASSE 2 MINIMA POTENZA DI USCITA: 2mW LUNGHEZZA D'ONDA EMESSA: 650 nm CONFORME A EN 60825-1 (2001)	LASERSTRAHLUNG NICHT IN DER STRAHL BLINKEN PRODUKT DER LASERKLASSE 2 MAXIMALE AUSGANGLEISTUNG: 2mW WELLENLÄNGE: 650 nm ENTSPR. EN 60825-1 (2001)	RAYON LASER EVITER DE REGARDER LE RAYON APPAREIL LASER DE CLASSE 2 PUISSANCE DE SORTIE: 2mW LONGUER D'ONDE EMISE: 650 nm CONFORME A EN 60825-1 (2001)	RAYO LÁSER NO MIRAR FIJO EL RAYO APARATO LÁSER DE CLASE 2 MÁXIMA POTENCIA DE SALIDA: 2mW LONGITUD DE ONDA EMITIDA: 650 nm CONFORME A EN 60825-1 (2001)

Laser Light Class II according to CDRH classification

ENGLISH

The following information is provided to comply with the rules imposed by international authorities and refers to the correct use of your mobile computer.

STANDARD LASER SAFETY REGULATIONS
This product conforms to the applicable requirements of both CDRH 21 CFR 1040 Subchapter J and EN 60825-1:2001 at the date of manufacture.
For installation, use and maintenance, it is not necessary to open the device.

⚠ **CAUTION**	*Do not attempt to open or otherwise service any components in the optics cavity. Opening or servicing any part of the optics cavity by unauthorized personnel may violate laser safety regulations. The optics system is a factory only repair item.*

⚠ **CAUTION**	*Use of controls or adjustments or performance of procedures other than those specified herein may result in exposure to hazardous visible laser light.*

The product utilizes a low-power laser diode. Although staring directly at the laser beam momentarily causes no known biological damage, avoid staring at the beam as one would with any very strong light source, such as the sun. Avoid that the laser beam hits the eye of an observer, even through reflective surfaces such as mirrors, etc.

⚠ **CAUTION**	*Use of optical systems with the scanner will increase eye hazard. Optical instruments include binoculars, microscopes, eye glasses and magnifying glasses.*

ITALIANO

Le seguenti informazioni vengono fornite dietro direttive delle autorità internazionali e si riferiscono all'uso corretto del terminale.

NORMATIVE STANDARD PER LA SICUREZZA LASER
Questo prodotto risulta conforme alle normative vigenti sulla sicurezza laser alla data di produzione: CDRH 21 CFR 1040 sezione J e EN 60825-1:2001.
Non si rende mai necessario aprire l'apparecchio per motivi di installazione, utilizzo o manutenzione.

⚠ **CAUTION**	*Non tentare di accedere allo scomparto contenete i componenti ottici o di farne la manutenzione. L'apertura dello scomparto, o la manutenzione di qualsiasi parte ottica da parte di personale non autorizzato, potrebbe violare le norme della sicurezza. Il sistema ottico può essere riparato solamente alla fabbrica.*

ATTENZIONE

L'utilizzo di procedure o regolazioni differenti da quelle descritte nella documentazione può provocare un'esposizione pericolosa a luce laser visibile.

Il prodotto utilizza un diodo laser a bassa potenza. Sebbene non siano noti danni riportati dall'occhio umano in seguito ad una esposizione di breve durata, evitare di fissare il raggio laser così come si eviterebbe qualsiasi altra sorgente di luminosità intensa, ad esempio il sole. Evitare inoltre di dirigere il raggio laser negli occhi di un osservatore, anche attraverso superfici riflettenti come gli specchi.

CAUTION

L'uso di strumenti ottici assieme allo scanner può aumentare il pericolo di danno agli occhi. Tali strumenti ottici includono cannocchiali, microscopi, occhiali e lenti di ingrandimento.

DEUTSCH

Die folgenden Informationen stimmen mit den Sicherheitshinweisen überein, die von internationalen Behörden auferlegt wurden, und sie beziehen sich auf den korrekten Gebrauch vom Terminal.

NORM FÜR DIE LASERSICHERHEIT
Dies Produkt entspricht am Tag der Herstellung den gültigen EN 60825-1:2001 und CDRH 21 CFR 1040 Subchapter J Normen für die Lasersicherheit.
Es ist nicht notwendig, das Gerät wegen Betrieb oder Installations-, und Wartungs-Arbeiten zu öffnen.

CAUTION

Unter keinen Umständen darf versucht werden, die Komponenten im Optikhohlraum zu öffnen oder auf irgendwelche andere Weise zu warten. Das Öffnen bzw. Warten der Komponenten im Optikhohlraum durch unbefugtes Personal verstößt gegen die Laser-Sicherheitsbestimmungen. Das Optiksystem darf nur werkseitig repariert werden.

ACHTUNG

Jegliche Änderungen am Gerät sowie Vorgehensweisen, die nicht in dieser Betriebsanleitung beschrieben werden, können ein gefährliches Laserlicht verursachen.

Der Produkt benutzt eine Laserdiode. Obwohl zur Zeit keine Augenschäden von kurzen Einstrahlungen bekannt sind, sollten Sie es vermeiden für längere Zeit in den Laserstrahl zu schauen, genauso wenig wie in starke Lichtquellen (z.B. die

Sonne). Vermeiden Sie es, den Laserstrahl weder gegen die Augen eines Beobachters, noch gegen reflektierende Oberflächen zu richten.

CAUTION

Die Verwendung von Optiksystemen mit diesem Scanner erhöht die Gefahr einer Augenbeschädigung.
Zu optischen Instrumenten gehören unter anderem Ferngläser, Mikroskope, Brillen und Vergrößerungsgläser.

FRANÇAIS

Les informations suivantes sont fournies selon les règles fixées par les autorités internationales et se réfèrent à une correcte utilisation du terminal.

NORMES DE SECURITE LASER
Ce produit est conforme aux normes de sécurité laser en vigueur à sa date de fabrication: CDRH 21 CFR 1040 sous-chapitre J et EN 60825-1:2001.
Il n'est pas nécessaire d'ouvrir l'appareil pour l'installation, l'utilisation ou l'entretien.

CAUTION

Ne pas essayer d'ouvrir ou de réparer les composants de la cavité optique. L'ouverture de la cavité optique ou la réparation de ses composants par une personne non qualifiée peut entraîner le nonrespect des règles de sécurité relatives au laser. Le système optique ne peut être réparé qu'en usine.

ATTENTION

L'utilisation de procédures ou réglages différents de ceux donnés ici peut entraîner une dangereuse exposition à lumière laser visible.

Le produit utilise une diode laser. Aucun dommage aux yeux humains n'a été constaté à la suite d'une exposition au rayon laser. Eviter de regarder fixement le rayon, comme toute autre source lumineuse intense telle que le soleil. Eviter aussi de diriger le rayon vers les yeux d'un observateur, même à travers des surfaces réfléchissantes (miroirs, par exemple).

CAUTION

L'utilisation d'instruments optiques avec le scanneur augmente le danger pour les yeux. Les instruments optiques comprennent les jumelles, les microscopes, les lunettes et les verres grossissants.

Las informaciones siguientes son presentadas en conformidad con las disposiciones de las autoridades internacionales y se refieren al uso correcto del terminal.

NORMATIVAS ESTÁNDAR PARA LA SEGURIDAD LÁSER
Este aparato resulta conforme a las normativas vigentes de seguridad láser a la fecha de producción: CDRH 21 CFR 1040 Sección y EN 60825-1:2001.
No es necesario abrir el aparato para la instalación, la utilización o la manutención.

⚠ **CAUTION**	*No intente abrir o de ninguna manera dar servicio a ninguno de los componentes del receptáculo óptico. Abrir o dar servicio a las piezas del receptáculo óptico por parte del personal no autorizado podría ser una violación a los reglamentos de seguridad. El sistema óptico se puede reparar en la fábrica solamente.*

⚠ **ATENCIÓN**	*La utilización de procedimientos o regulaciones diferentes de aquellas descritas en la documentación puede causar una exposición peligrosa a la luz láser visible.*

El aparato utiliza un diodo láser a baja potencia. No son notorios daños a los ojos humanos a consecuencia de una exposición de corta duración. Eviten de mirar fijo el rayo láser así como evitarían cualquiera otra fuente de luminosidad intensa, por ejemplo el sol. Además, eviten de dirigir el rayo láser hacia los ojos de un observador, también a través de superficies reflectantes como los espejos.

⚠ **CAUTION**	*El uso de sistemas ópticos con el escáner aumentará el riesgo de daños oculares. Los instrumentos ópticos incluyen binoculares, microscopios, lentes y lupas.*

RADIO COMPLIANCE

In radio systems configured with mobile computers and access points, the frequencies to be used must be allowed by the spectrum authorities of the specific country in which the installation takes place.
Be absolutely sure that the system frequencies are correctly set to be compliant with the spectrum requirements of the country.

Information for the User

ENGLISH

Contact the competent authority responsible for the management of radio frequency devices of your country to verify any possible restrictions or licenses required.
Refer to the web site http://europa.eu.int/comm/enterprise/rtte/spectr.htm for further information.

ITALIANO

Prendi contatto con l'autorità competente per la gestione degli apparati a radio frequenza del tuo paese, per verificare eventuali restrizioni o licenze. Ulteriori informazioni sono disponibili sul sito:
http://europa.eu.int/comm/enterprise/rtte/spectr.htm.

FRANÇAIS

Contactez l'autorité compétente en la gestion des appareils à radio fréquence de votre pays pour vérifier d'éventuelles restrictions ou licences. Pour tout renseignement vous pouvez vous adresser au site web:
http://europa.eu.int/comm/enterprise/rtte/spectr.htm.

DEUTSCH

Wenden Sie sich an die für Radiofrequenzgeräte zuständige Behörde Ihres Landes, um zu prüfen ob es Einschränkungen gibt, oder eine Lizenz erforderlich ist. Weitere Informationen finden Sie auf der Web Seite:
http://europa.eu.int/comm/enterprise/rtte/spectr.htm.

ESPAÑOL

Contacta la autoridad competente para la gestión de los dispositivos de radio frecuencia de tu país, para verificar cualesquiera restricciones o licencias posibles requerida. Además se puede encontrar mas información en el sitio Web:
http://europa.eu.int/comm/enterprise/rtte/spectr.htm.

CE ①

FCC COMPLIANCE

Modifications or changes to this equipment without the expressed written approval of Datalogic could void the authority to use the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.
If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

DL-FORMULA™ BT LASER Bluetooth model contains transmitter with FCC-ID: RFR-B2029

SAR COMPLIANCE

This product has been tested and found to comply with the following standards:

- OET BULLETIN 65 SUPPLEMENT C: evaluating compliance with FCC guidelines for human exposure to radio frequency electromagnetic fields.

- EN 50371:2002: Generic standard to demonstrate the compliance of low power electronic and electrical apparatus with the basic restrictions related to human exposure to electromagnetic fields (10 MHz - 300 GHz). General public

WIRELESS AND RADIO FREQUENCIES WARNINGS

![warning]	*Use only the supplied or an approved replacement antenna. Unauthorized antennas, modifications or attachments could damage the product and may violate laws and regulations.*
WARNING	

![warning]	*Most modern electronic equipment is shielded from RF signals. However, certain electronic equipment may not be shielded against the RF signals generated by Datalogic Formula™.*
WARNING	

![warning]	*Datalogic recommends persons with pacemakers or other medical devices to follow the same recommendations provided by Health Industry Manufacturers Associations for mobile phones.*
WARNING	*Persons with pacemakers:*

- *Should ALWAYS keep this device more than twenty five (25) cm from their pacemaker and/or any other medical device;*
- *Should not carry this device in a breast pocket;*
- *Should keep the device at the opposite side of the pacemaker and/or any other medical device;*
- *Should turn this device OFF or move it immediately AWAY if there is any reason to suspect that interference is taking place.*
- *Should ALWAYS read pacemaker or any other medical device guides or should consult the manufacturer of the medical device to determine if it is adequately shielded from external RF energy.*

In case of doubt concerning the use of wireless devices with an implanted medical device, contact your doctor.

![warning]	*Turn this device OFF in health care facilities when any regulations posted in these areas instruct you to do so. Hospitals or health care facilities may use equipment that could be sensitive to external RF energy.*
WARNING	

![warning]	*Do not use the device while driving: give full attention to driving — driving safely is your first responsibility.* *The device is not designed to be used with a GPS system. Any program installed without Datalogic authorization may affect the device's safety.*
WARNING	

<table>
<tr>
<td>⚠️
WARNING</td>
<td>*RF signals may affect improperly installed or inadequately shielded electronic systems in motor vehicles. Check with the manufacturer or its representative regarding your vehicle. You should also consult the manufacturer of any equipment that has been added to your vehicle.*</td>
</tr>
</table>

<table>
<tr>
<td>⚠️
WARNING</td>
<td>*An air bag inflates with great force. DO NOT place objects, including either installed or portable wireless equipment, in the area over the air bag or in the air bag deployment area. If vehicle's wireless equipment is improperly installed and the air bag inflates, serious injury could result.*</td>
</tr>
</table>

<table>
<tr>
<td>⚠️
WARNING</td>
<td>*Turn off the device when in any area with a potentially explosive atmosphere. Observe restrictions and follow closely any laws, regulations, warnings and best practices on the use of radio equipment near fuel storage areas or distribution fuel areas, chemical plants or where some operation involves use of explosive materials.*

Do not store or carry flammable liquids, explosive gases or materials with the device or its parts or accessories.

Areas with a potentially explosive atmosphere are often, but not always, clearly marked or showed.

Sparks in such areas could cause an explosion or fire, resulting in injury or even death.</td>
</tr>
</table>

PATENTS

This product is covered by one or more of the following patents.
Design Pat. AU 310182 S; CN 658612; HK 0601962.6; KR 30-0466667; TW D118829.
US Pat. 5,992,740; European Pat. 789,315 B1.

Additional patents pending.

WEEE COMPLIANCE

Informazione degli utenti ai sensi della Direttiva Europea 2002/96/EC

L'apparecchiatura che riporta il simbolo del bidone barrato deve essere smaltita, alla fine della sua vita utile, separatamente dai rifiuti urbani.

Smaltire l'apparecchiatura in conformità alla presente Direttiva consente di:
- evitare possibili conseguenze negative per l'ambiente e per la salute umana che potrebbero invece essere causati dall'errato smaltimento dello stesso;
- recuperare materiali di cui è composto al fine di ottenere un importante risparmio di energia e di risorse.

Per maggiori dettagli sulle modalità di smaltimento, contattare il Fornitore dal quale è stata acquistata l'apparecchiatura o consultare la sezione dedicata sul sito www.mobile.datalogic.com.

Information for the user in accordance with the European Commission Directive 2002/96/EC

At the end of its useful life, the product marked with the crossed out wheeled wastebin must be disposed of separately from urban waste.

Disposing of the product according to this Directive:
- avoids potentially negative consequences to the environment and human health which otherwise could be caused by incorrect disposal
- enables the recovery of materials to obtain a significant savings of energy and resources.

For more detailed information about disposal, contact the supplier that provided you with the product in question or consult the dedicated section at the website www.mobile.datalogic.com.

Information aux utilisateurs concernant la Directive Européenne 2002/96/EC

Au terme de sa vie utile, le produit qui porte le symbole d'un caisson à ordures barré ne doit pas être éliminé avec les déchets urbains.

Éliminer ce produit selon cette Directive permet de:
- éviter les retombées négatives pour l'environnement et la santé dérivant d'une élimination incorrecte
- récupérer les matériaux dans le but d'une économie importante en termes d'énergie et de ressources

Pour obtenir des informations complémentaires concernant l'élimination, veuillez contacter le fournisseur auprès duquel vous avez acheté le produit ou consulter la section consacrée au site Web www.mobile.datalogic.com.

Información para el usuario de accuerdo con la Directiva Europea 2002/96/CE

Al final de su vida útil, el producto marcado con un simbolo de contenedor de bassura móvil tachado no debe eliminarse junto a los desechos urbanos.

Eliminar este producto de accuerdo con la Directiva permite de:
- evitar posibles consecuencias negativas para el medio ambiente y la salud derivadas de una eliminación inadecuada
- recuperar los materiales obteniendo así un ahorro importante de energía y recursos

Para obtener una información más detallada sobre la eliminación, por favor, póngase en contacto con el proveedor donde lo compró o consultar la sección dedicada en el Web site www.mobile.datalogic.com.

Benutzerinformation bezüglich Richtlinie 2002/96/EC der europäischen Kommission

Am Ende des Gerätelebenszyklus darf das Produkt nicht über den städtischen Hausmüll entsorgt werden. Eine entsprechende Mülltrennung ist erforderlich.

Beseitigung des Produkts entsprechend der Richtlinie:
- verhindert negative Auswirkungen für die Umwelt und die Gesundheit der Menschen
- ermöglicht die Wiederverwendung der Materialien und spart somit Energie und Resourcen

Weitere Informationen zu dieser Richtlinie erhalten sie von ihrem Lieferanten über den sie das Produkt erworben haben, oder besuchen sie unsere Hompage unter www.mobile.datalogic.com.

CHINA ROHS POLLUTION CONTROL LOGOS

Part name	Toxic or Hazardous Substances and Elements					
	Pb	Hg	Cd	Cr6+	PBB	PBDE
Upper Case	O	O	O	O	O	O
Lower Case	O	O	O	O	O	O
Touch Panel	O	O	O	O	O	O
PCB Board	O	O	O	O	O	O
Laser Engine	X	O	O	O	O	O
BT Module (Note 1)	O	O	O	O	O	O

O: Indicates that this is a toxic or hazardous substance contained in all of the homogenous materials for this part is below the limit requirement in SJ/T11363-2006.

X: Indicates that this is toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006.

Note 1: this is only for DL-FORMULA™ BT LASER Model.

Note 2: 99% of the parts of this product adopt the nonpoisonous and harmless environmental protection material to make, the part with poisonous harmful substance or the element is all unable to realize the substitution of the poisonous harmful thing or the element because the global technological development level is limited.

GENERAL VIEW
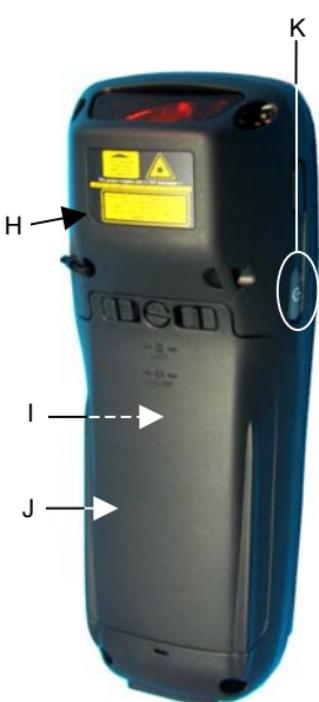
A) FSTN Transflective LCD B/W Led Backlight
B) Good Read or User Programmable LED
C) Charging Status LED
D) User Programmable LED
E) Scan Key

F) Keyboard
G) Radio Status LED
H) Laser Safety Label
I) Product Label (under battery)
J) Battery Pack
K) ON/OFF Power Key
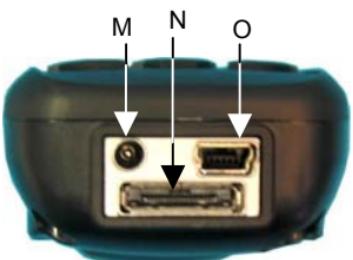
L) Data Capture/Laser Output Window *
M) DC Charger Connector

N) Communication/Charger Connector (through cradle); Serial Connector (through cable)
O) Mini USB Communication Connector (through cable)

- Remove protective film cover before use.

1   INTRODUCTION

1.1   FORMULA™ DESCRIPTION

The Formula™ combines fast, accurate barcode scanning and communications options in a small and ergonomic package.
It is ready to use out of the box, as the product is provided with a power supply and USB cable.
Easy to install, lightweight, and cost-effective, the Formula™ is built to work hard through long shifts.
It also makes your work easy and efficient in any condition thanks to its rechargeable Li-Ion battery.
A set of connectors placed on the bottom of the terminal make it always ready to be connected or to recharge the battery.
The Formula™ pocket terminal includes standard technologies: USB and Bluetooth (optional) allow it to be connected to many infrastructures.
An easy-to-read backlit LCD screen displays all the information needed during customer applications in any light condition.
The Formula™: the largest advantages in a very small package!

1.2   AVAILABLE MODELS

The brand new Formula™ is available in different models depending on the options it is equipped with. All options are listed below:

- communication options: Bluetooth®

- capture options: Laser

For further details about the Formula™ models refer to the web site: http://www.mobile.datalogic.com.

1.3   PACKAGE CONTENTS

The Formula™ package contains:

−   1 Formula™ mobile computer

−   1 AC/DC power supply USA Plug

−   1 AUS Plug Adapter

−   1 UK Plug Adapter

−   1 EU Plug Adapter

−   1 standard Mini USB cable

−   1 CD-ROM containing:
           Formula™ Software Tools installation software
           The complete documentation and all manuals in PDF format
           See chapter 3.1 "Formula™ Software Tools Overview" for further
           details

−   1 user's manual

−   1 quick starting guide

−   1 rechargeable standard 1000 mAh battery pack + cover

−   1 hand-strap

Any other packages will contain the accessories necessary for the Formula™ connection to the host computer and to the network: the cradle, one or more connection cables.

Remove all the components from their packaging; check their integrity and congruity with the packing documents.

⚠ CAUTION	*Keep the original packaging for use when sending products to the technical assistance center. Damage caused by improper packaging is not covered under the warranty.*

✍ NOTE	*Rechargeable backup batteries and battery packs are not initially charged. Therefore the initial operation to perform is to charge them. See paragraphs 4.1 and 4.2.*

1.4   INSERTING AN SD CARD

Formula™ provides the possibility to add an SD Formula™ storage card. To access the SD card slot and insert the card, proceed as follows:

   1.   Extract the SD card slot cover from the side of the mobile computer. Then carefully pull it out to unlock its base as shown in the picture below:

   2.   Insert the card with the written part upward and push it in, aided by the back of a pen, until it clicks into place.

To remove the SD card, just push it toward the inside, aided by the back of a pen, until it clicks; a spring system will return it out.

⚠️ **CAUTION**	*Follow proper ESD precautions to avoid damaging the SD. Proper ESD precautions include, but are not limited to, working on an ESD mat and ensuring that the operator is properly grounded.* *Do not force the card. If you feel resistance, remove the card, check the orientation, and reinsert it.* *Do not use the SD card slot for any other accessories.*

☝️ **NOTE**	*Only MMC/SD with FAT 16 format are supported.*

1.5   ACCESSORIES

❑ **Cradles**

94A151111 Datalogic Memor™ single cradle with spare battery slot; RS232 and USB communications

❑ **Batteries**

94ACC1326 Datalogic Memor™ Standard Battery Pack (Li-Ion battery pack 1000 mAh@3.7 V) + cover
94ACC1325 Datalogic Memor™ Large Capacity Battery Pack (Li-Ion battery pack 2000 mAh@3.7 V) + cover
94ACC1327 Adapter for 3 AAA Alkaline batteries + cover

❑ **Power Supply**

94ACC1324 PG5-30P35 AC/DC Power Supply USA Plug
94ACC1334 PG5-30P35 AUS Plug Adapter (10pcs)
94ACC1335 PG5-30P35 UK Plug Adapter (10pcs)
94ACC1339 PG5-30P5 EU Plug Adapter (10pcs)

❑ **Cables**

94A051016 CAB-421 Mini USB Straight Cable
94A051022 WIN-NET Serial Cable (HRS ST40X-18S-CV)

Use only a Datalogic Mobile-approved power supply and cables. Use of an alternative power supply will invalidate any approval given to this device and may be dangerous.

**NOTE**

---

2   CONNECTIONS

2.1   USB CONNECTION

You can use any standard mini USB cable to directly connect the Formula™ to a host computer to transfer data through the USB interface.

Key:
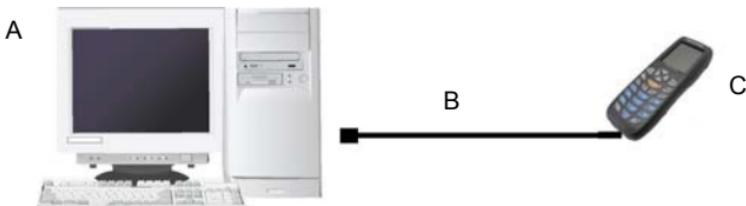
A   Host computer   C   Formula™
B   Standard mini USB cable

The single cradle can be connected to the Host by any standard mini USB cable to transfer data through the USB interface.

Key:
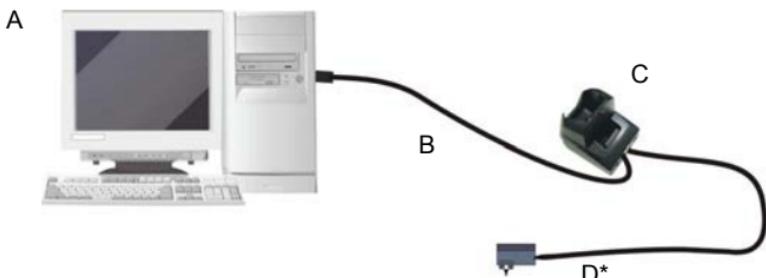
A   Host computer   C   Single cradle
B   Standard mini USB cable   D   *Power supply (only necessary for battery charging)

In this case the power supply is only necessary for battery charging. Insert the power supply plug into the power jack on the base of the cradle and attach the power supply to a power outlet.

2.2   RS232 CONNECTION

You can use a cable to directly connect the Formula™ to a host computer to transfer data through the RS232 interface.


Key:

A   Host computer   C   Formula™
B   94A051022 WIN-NET
     (HRS ST40X-18S-CV)

The single cradle can be connected to the Host by any standard 9-pin serial null-modem cable for RS232 communications.
Once the Host has been turned on, insert the Formula™ mobile computer into the cradle.

Key:
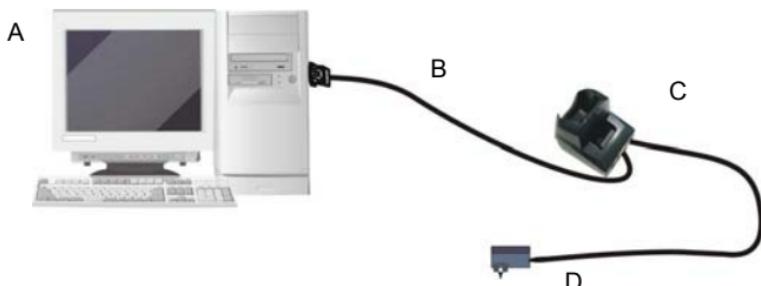
A   Host computer   C   Single cradle
B   94A051020 CAB-427   D   Power supply (only necessary for
     Null-Modem   battery charging)

In this case the power supply is only necessary for battery charging. Insert the power supply plug into the power jack on the base of the cradle and attach the power supply to a power outlet.

2.3 BLUETOOTH® CONNECTIONS

Bluetooth® Formula™ mobile computer models can be connected to a Bluetooth® host device with a point to point connection.


Key:

    A)   Formula™
    B)   Host computer with Bluetooth® connectivity

## 2.4 CONNECTION CABLES

The following cable contains its order number.

❏ **RS232 Direct Connection:**
   94A051022 WIN-NET SERIAL CAB (HRS ST40x-18S-CV)
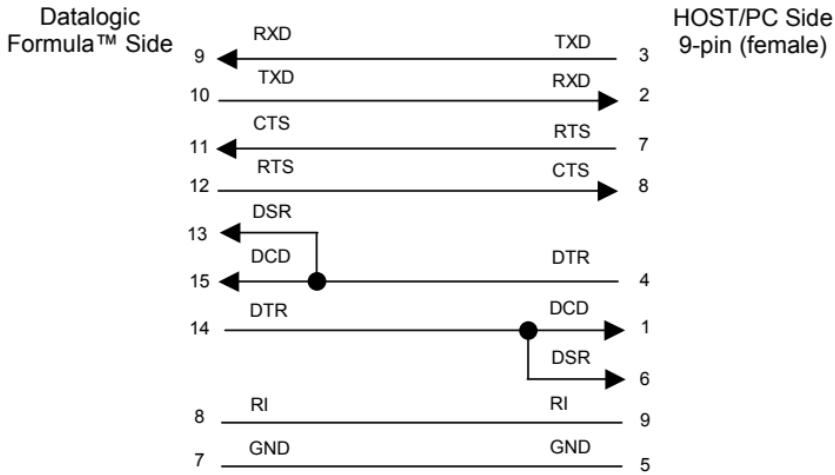
❏ **Power Supply Polarity:**
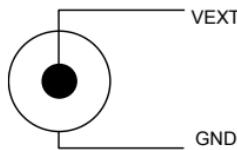
3 USE AND FUNCTIONING

Formula™ is a lightweight, pocket-sized and fully programmable terminal with 1024 KB of RAM memory to manage large databases and 512 KB of Flash memory for application programs of large dimensions.

3.1 FORMULA™ SOFTWARE TOOLS OVERVIEW

The CD-ROM Formula™ SW TOOLS contains the software for Formula™ terminal.

It includes:

- Formula™ Software Tools installation software
- the complete documentation and all manuals in PDF format.

3.1.1 Formula™ Software Tools Components

The Formula™ SW TOOLS components are grouped in the following three main categories:

Development
SW Developer's Toolkits (DS for Formula™)
EasyGen™
OleForFormula™

Communication
Systools™

Ready-To-Use Applications
Standard Mode M1
Enhanced Mode M2
PALPRO

3.1.2 Formula™ Software Tools Installation

The installation software allows to install the Formula™ SW TOOLS components according to three different types of installation:

- User
- Developer
- Custom

The following table specifies which components can be installed for each type of installation:

Formula™ SW TOOLS Component	User Installation	Developer Installation	Custom Installation
SW Developer's Toolkits (DS for Formula™)	No	Yes	Yes/No
EasyGen™	No	Yes	Yes/No
SysTools™	Yes	Yes	Yes/No
OLE for Formula™	No	Yes	Yes/No
Ready-To-Use Applications	Yes	Yes	Yes/No

3.1.3 SW Developer's Toolkits Component Overview

The **Software Developer's Toolkits** component is the **DS for Formula™** environment for developing custom applications with the 8051 Keil Compiler.
A set of Workdemo examples source code is installed together with this component.

DS for Formula™ is a software package that provides instruments for fully exploiting **Formula™** terminals by creating fully-structured and personalized applications.
DS for Formula™ can be used to:
- generate applications for new Formula™ terminal;
- re-generate applications developed for old Formula™ terminals to let them run on new Formula™ terminal.

The DS for Formula™ distributed with this product can not generate applications for old Formula™ terminals.
For compatibility and portability details see SW Dev Toolkits Developer's Manual Vol2. Section A.

DS for Formula™ uses a «C» standard ANSI compiler, integrated with special libraries, operating in a MS-DOS environment and developed specifically for the type of terminal processor. The libraries, developed by Datalogic Mobile S.r.l., permit direct management of the terminal functions. For example, the management of barcode reading devices is immediate and rational thanks to the interaction with functions that automatically start up the barcode acquisition procedure.
Equally transparent, by using a philosophy of events programming, is the procedure managing the keyboard, display, serial and radio-frequency communication, calendar/clock and the data memory organized into banks, either directly or through a vdisk function.
DS for Formula™ also offers a series of effective general purpose application examples, which represent an excellent starting point while simultaneously providing a practical guide for studying and working on complex or personalized programs. Refer to the SW Dev Toolkits Developer's Manual for details.

Software required on Host Computer

| COMPONENT	SOFTWARE INSTALLATION	DOCUMENTATION
DS for Formula™	Refer to chapter 1.2 of this manual	Refer to SW Dev Toolkits Developer's Manual for further information
8051 Keil Compiler V8	Refer to Keil Compiler installation	Refer to compiler documentation
SysTools™	Refer to chapter 1.2 of this manual	Refer to SysTools™ user's manual for further information

Software required on Formula™ Terminal

COMPONENT	SOFTWARE USE	DOCUMENTATION
Custom Application development	**1.** Create an application or select a Workdemo example installed together with DS for Formula™ **2.** Compile the application	For environment setup, application development and Workdemo examples refer to SW Dev Toolkits Developer's Manual
Custom Application download	**3.** Download the developed Custom Application through SysTools™ host computer application	Refer to SysTools™ user's manual for further information
Data transfer	**4.** After data collection you can transfer data to host computer using the programmed communication interface on the host computer	For Workdemo examples type of communication interface refer to SW Dev Toolkits Developer's Manual

Host Computer

DS For Formula™

Keil Compiler
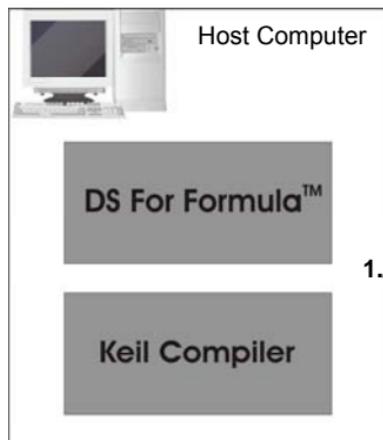
1./2. develop custom application

Host Computer

Formula™

SysTools™
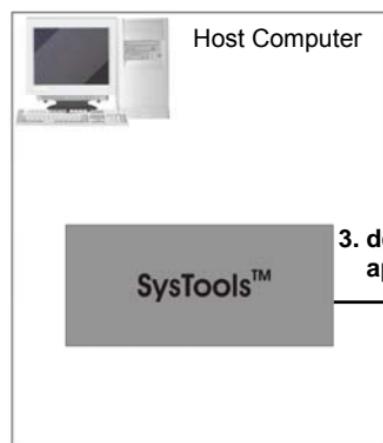
3. download custom application

Bootloader

Host Computer

Formula™

Selected Application
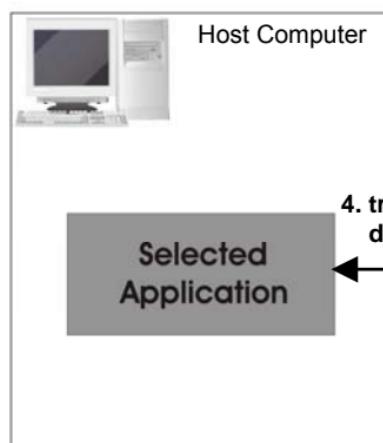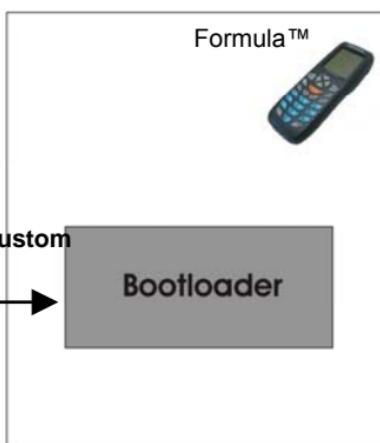
4. transfer collected data to PC

Custom Application
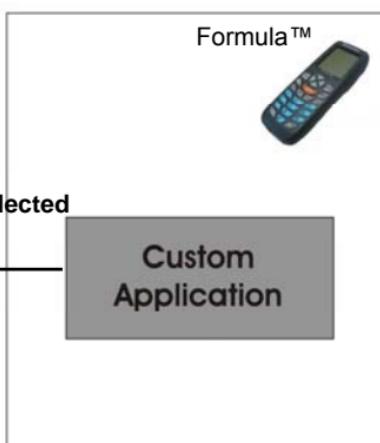
NOTE

Downloading an executable file not generated with the DS for Formula™ Rel 2.00 or later release can damage the device!
Application programs developed for other Formula™ devices are not compatible at execution level, they must be recompiled with Ds for Formula™ Rel 2.00 or later releases.
Correct functioning and behaviour of the terminal is guaranteed only under these conditions.

3.1.4 EasyGen^{TM} Component Overview

EasyGen™ component is a rapid Application Generator to generate easy and quick Applications running on Formula™ device.

A set of ready-to-use EasyGen™ Application examples are installed together with this component. These are the most common application examples (data collection, inventory, goods picking, assisted sales) available in 5 languages (English, French, German, Italian, Spanish).

By using the EasyGen™ application generator, developers can easily customize applications according to the end user's specific needs, solving the most common data collection applications such as inventory, picking and shipping/receiving.

EasyGen™ is the ideal solution for making Formula™ batch terminals productive instantly. In a familiar environment, developers have all the instruments at their disposal to reduce programming times (and therefore costs) while maintaining a high standard of quality in the creation of personalized applications whatever their nature, whether simple (e.g. a program for inserting codes/quantities) or more sophisticated.

Software required on Host Computer

COMPONENT	SOFTWARE INSTALLATION	DOCUMENTATION
EasyGen™	Refer to chapter 1.2 of this manual	Refer to EasyGen™ user's manual for further information
SysTools™	Refer to chapter 1.2 of this manual	Refer to SysTools™ user's manual for further information

Software required on Formula™ Terminal

COMPONENT	SOFTWARE INSTALLATION	SOFTWARE USE	DOCUMENTATION
EasyGen™ Interpreter	The interpreter is installed on the host computer together with EasyGen™ component	**1.** Download the EasyGen™ Formula™ interpreter through EasyGen™ host computer application. Alternatively you can download it through SysTools™ host computer application	Refer to EasyGen™ or SysTools™ user's manual for further information Refer to EasyGen™ user's manual for installation folder of Formula™ Interpreter
EasyGen™ Application	Examples of applications ready to use are installed on the host computer together with EasyGen™ component installation New applications can be created with EasyGen™.	**2.** Download the EasyGen™ Formula™ application through EasyGen™ host computer application. Alternatively you can download it through SysTools™ host computer application	Refer to EasyGen™ or SysTools™ user's manual for further information. Refer to EasyGen™ user's manual for installation folder of Applications examples
Data transfer		**3.** Collect data on the terminal **4.** Configure SysTools™ Startup Mode in EasyGen Mode **5.** Transfer data to host computer via SysTools™	Refer to SysTools™ user's manual for further information

Host Computer	Formula™
EasyGen™	Bootloader

1. download EasyGen™ interpreter

Host Computer	Formula™
EasyGen™	EasyGen™ Interpreter

2. download EasyGen™ application

Host Computer	Formula™
SysTools™ EasyGen Mode	EasyGen™ Application EasyGen™ Interpreter

5. transfer collected data to PC
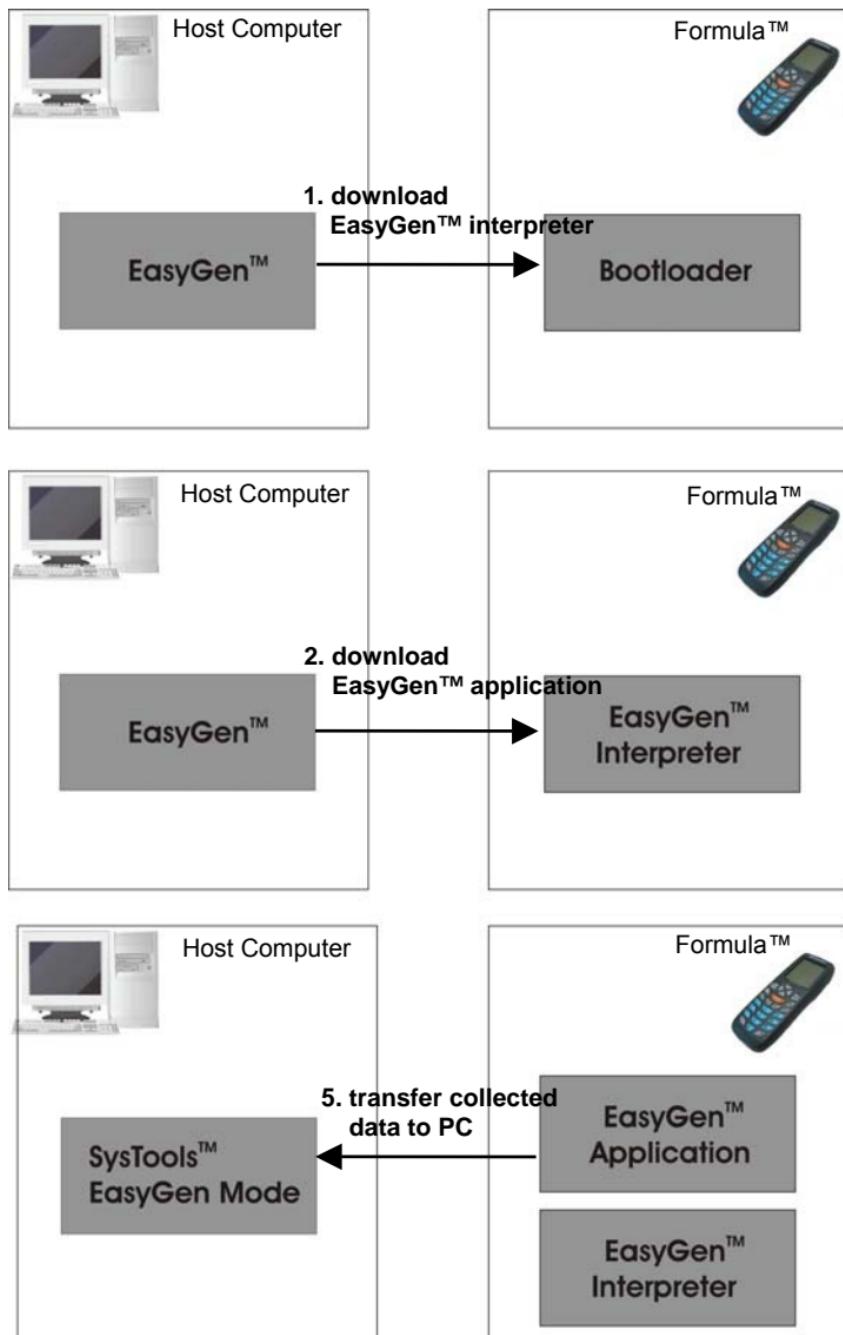
3.1.5   SysTools™ Component Overview

SysTools™ is an efficient software utility to download application to Formula™ terminal, to exchange data with the terminal and to transfer data to standard ASCII files on the host computer through Serial or USB interface.
Refer to the SysTools™ user's manual for further details.

3.1.6   OLE for Formula™ Component Overview

OLE for Formula™ is the software module ActiveX - OLE Custom Control or OCX, allowing users to easily integrate their data into applications such as Visual Basic, Excel, Access, Delphi, etc.
Refer to the OLE for Formula™ reference manual for further details.

3.1.7   Ready-To-Use Applications Component Overview

This component includes Standard Mode M1, Enhanced Mode M2 and PALPRO (Portable Application Library) ready-to-use applications.
Standard Mode M1 application is a Code-Quantity application allowing data received from Formula™ terminal to be stored in a default record format.
Enhanced Mode M2 application is a fully configurable application for creating typical Asset Management or Inventory applications. Data received from Formula™ terminal are stored in a customized record format and specific checks can be made on each item data. Record format can be programmed with SysTools™ .

PALPRO combines two Portable Applications Library (PAL) applications, **AssetPRO** and **INVPRO**, into a single, convenient program:
use **ASSETPRO** to track assets (such as furniture, phones, computers, and electronic equipment) at various locations (e.g., departments, rooms, floors, buildings);
use **INVPRO** to track inventory. **IT** provides a choice of one prompt or two.

Software required on Host Computer

COMPONENT	SOFTWARE INSTALLATION	DOCUMENTATION
Standard Mode M1 or Enhanced Mode M2	Refer to chapter 1.2 of this manual	Refer to Ready-to-Use Applications user's manual for further information
SysTools™	Refer to chapter 1.2 of this manual	Refer to SysTools™ user's manual for further information
PALPRO	Refer to chapter 1.2 of this manual	Refer to Datalogic Formula™ Quick Reference Guide for further information

**Software required on Formula™ terminal for Standard Mode M1**

COMPONENT	SOFTWARE USE	DOCUMENTATION
Standard Mode M1 Executable Applications	**1.** Configure SysTools™ Startup Mode in Standard/Enhanced Mode **2.** Download the Standard Mode executable Files from host computer to Formula™ through SysTools™	Refer to SysTools™ user's manual for further information
Data Transfer	**3.** Collect data on the terminal **4.** Transfer data to PC via SysTools™	
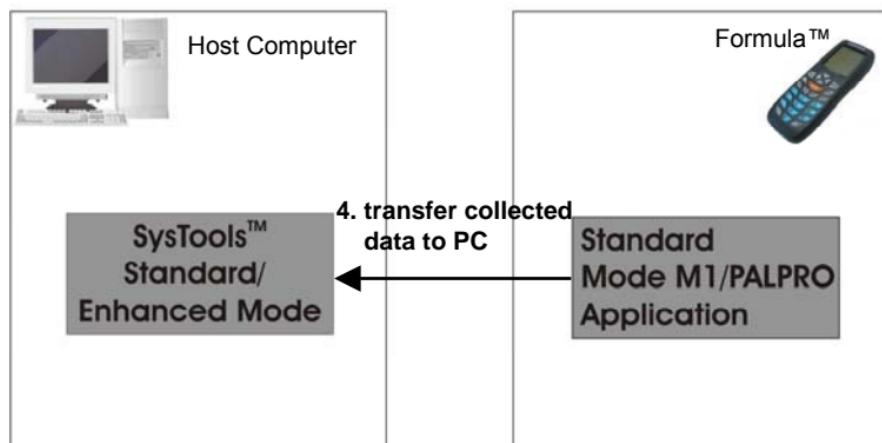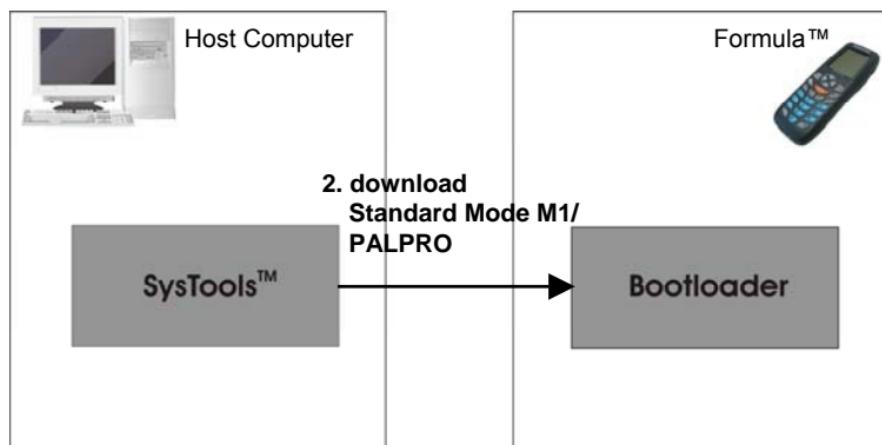
Software required on Formula™ terminal for Enhanced Mode M2

COMPONENT	SOFTWARE USE	DOCUMENTATION
Enhanced Mode M2 Executable Applications	**1.** Configure SysTools™ Startup Mode in Standard/Enhanced Mode **2.** Download the Enhanced Mode executable Files from host computer to Formula™ through SysTools™	Refer to SysTools™ user's manual for further information
Record customization	**3.** Create tables for record customization and download tables through SysTools™	Refer to Ready-to-Use Applications user's manual for further information
Data Transfer	**4.** Collect data on the terminal **5.** Transfer data to PC via SysTools™	

Host Computer — Formula™

2. download Standard Mode M2

SysTools™ → Bootloader

Host Computer — Formula™

3. download tables with record format

SysTools™ Standard/ Enhanced Mode → Enhanced Mode M2 Application

Host Computer — Formula™

5. transfer collected data to PC

SysTools™ Standard/ Enhanced Mode ← Enhanced Mode M2 Application
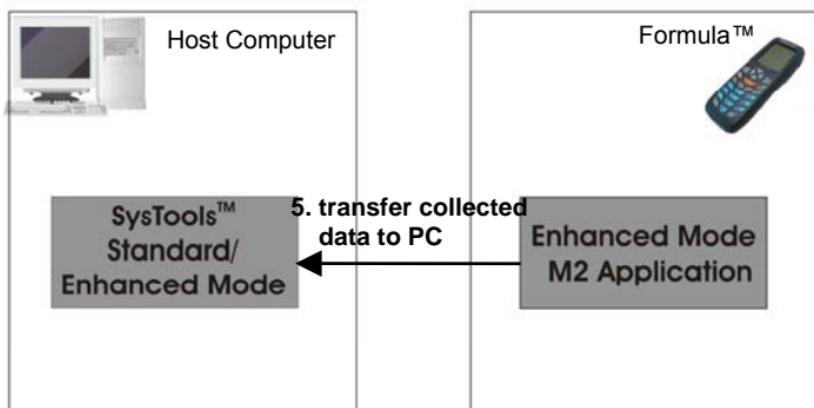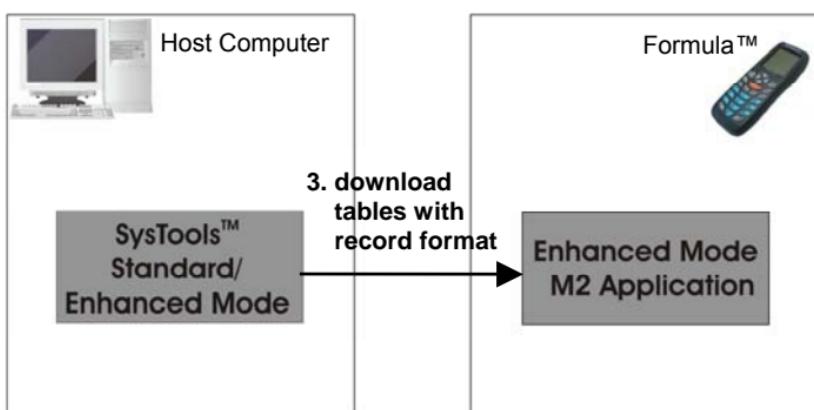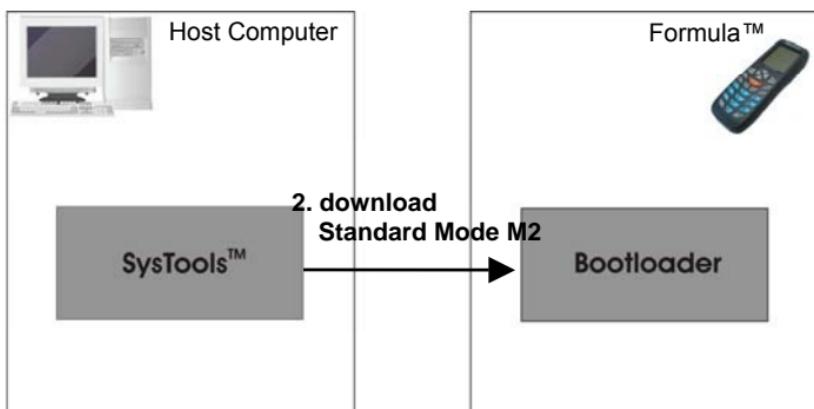
3.2 APPLICATION PROGRAM

PALPRO application program is pre-loaded.
For further information, refer to Datalogic Formula™ Quick Reference Guide.

3.3 DELETING AND LOADING THE APPLICATION PROGRAM

This procedure allows deleting application programs developed with DS for Formula™. If you want to delete programs provided or developed by EasyGen™, refer to chapter 6 of the EasyGen™ manual.

👆
NOTE
The following procedure causes data to be deleted even if not completed.

To delete the application program, follow the instructions below:

1- Press the <SCAN> key and the ON/OFF power key simultaneously; the display will show:

```
      PROGRAM
      ERASE?

Up = No  Down = Yes
```
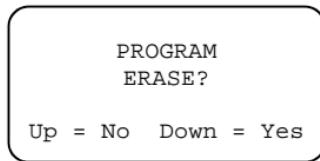
👆
NOTE
If you do not want to delete the application program, press the {▲} key or wait about 25 seconds.

2- To continue with the deletion, press the ▼ key; after a few seconds, the display will show:

```
   Boot from:
   1. USB
   2. MMC
   3. Serial
```
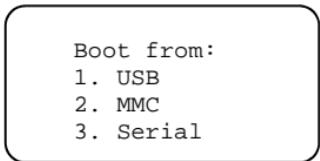
Select one of the boot mode options by pressing the following keypad buttons:
- Press 1 to select download via USB cable connection.
- Press 2 to select download via MMC/SD card.
- Press 3 to select download via serial cable connection.

After the boot mode selection the display will show:

```
BOOTSTRAP-
    LOADER
ErasPrgFlash
```
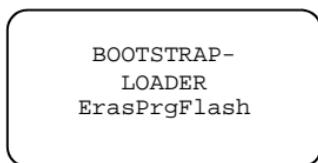
Once the deletion procedure is completed, the terminal is ready to receive a new application program.
If download via USB has been selected, the display will show:

```
BOOTSTRAP-
    LOADER
WaitDownload USB
```
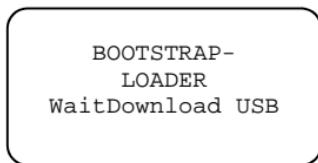
If download via MMC/SD has been selected, the display will show:
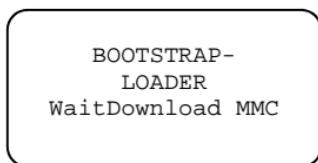
```
BOOTSTRAP-
    LOADER
WaitDownload MMC
```

Check if card is:
-Correctly inserted
-FAT16 formatted
-The file to download is present on the card with the correct filename and extension.
File name must be DS_OUT. File extension is .HEX in case of single bank application or .HXX in case of a multi-bank application.

If download via serial connection has been selected, the display will show:

```
BOOTSTRAP-
    LOADER
WaitDownload Ser
```
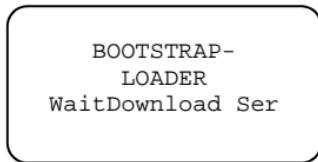
Application program download via USB or via RS232 can be done using SysTools™ program or EasySend™ program. For details, see SysTools™ User's Manual and SW Dev Toolkits Developer's Manual.

3.4   DOWNLOADING DATA TO HOST

Data can be downloaded from the terminal to the host PC in different ways, depending on the application loaded and on the terminal model.
The application software allows to download data onto the host PC by simply inserting the terminal into the cradle, by inserting cables directly into the terminal or by direct operator intervention on the terminal or on the host computer.

Figure 1 - Downloading Data RS232

Figure 2 - Downloading Data USB

Three different uses of USB connection can be configured at application level:
-    USB mass storage
-    USB serial emulation
-    USB Keyboard
For more details, refer to SW Dev Toolkits Developer's Manual and SDK.

If working with Bluetooth model, the application software can also allow to download data by radio frequency transmission between the terminal and a Bluetooth host device.


Figure 3 - Downloading Data Bluetooth®

3.5 DATA CAPTURE

3.5.1 Laser Data Capture

To scan barcodes, point the Formula™ laser model onto the code from a distance within the reading range while pressing the SCAN key.

The lighted band emitted by the laser must completely intercept the barcode as shown in the figure below. If enabled, the emission of an acoustic signal will indicate that the scan has taken place correctly.
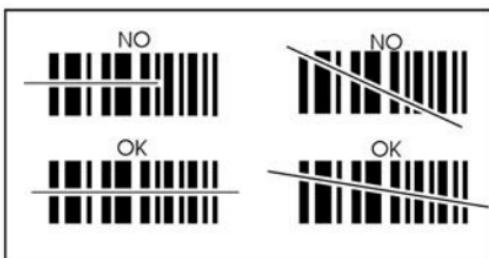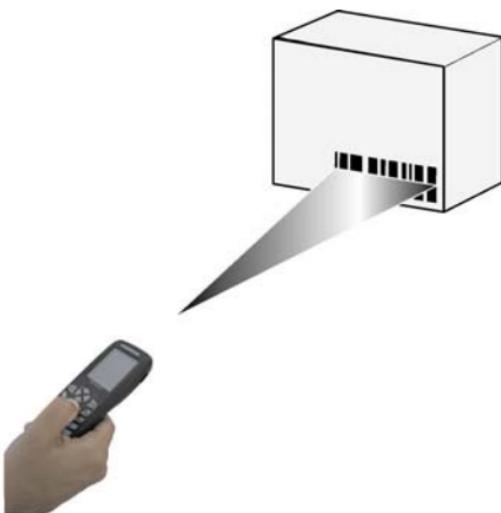
Remove the protective film cover over the Laser Output Window before use.

NOTE

3.6   DESCRIPTION OF THE KEYS USING EASYGEN™

It is possible to assign customized functions to function keys depending on the application program developed. The functions described below refer to a terminal using an application program developed with the EasyGen™ Application Generator.

CAUTION	*Refer to chapter 6 "EasyGen™ Interpreter Program" of the EasyGen™ User's Manual for more details about the key functions.*

NOTE	*Every time a key is pressed, the Formula™ terminal remains turned on for a maximum of 20 seconds.*

ARROW KEYS: only available for the application when not in "Select or Data Edit" mode.

SCAN KEY: activates the laser for barcode scanning and turns on the terminal when it is off.

FUNCTION KEYS: keys <F1>, <F2>, <F3> and <F4> are available for the loaded application. Function F5 activates the "Select" mode and only in this mode you can use F6, F7 and F8 functions:
<SHIFT> followed by <F1> = F5 "Select" mode
<SHIFT> followed by <F2> = F6 Data search
<SHIFT> followed by <F3> = F7 Deletion
<SHIFT> followed by <F4> = F8 Data display.

ESC KEY: used in the "Data display" mode.

POWER DOWN AND RESUME: by pressing the <ON/OFF> power key, the system is brought to a power-down state; press the <ON/OFF> power key again to resume.

SHIFT KEY: Enables the entry of alphabetical characters (written in white on the keyboard) when followed by the pressing of a numeric key: for example if you want to enter the alphabetical character "A", you have to press: <SHIFT>+<7>.

The number of times the SHIFT key is pressed determines the choice of alphabetical character: for example if you want to enter the alphabetical character "N", you have to press <SHIFT>+<SHIFT>+<5>, if you want to enter the alphabetical character "X", you have to press:

<SHIFT>+<SHIFT>+<SHIFT>+<2> and so on.

The fourth time the SHIFT key is pressed, the SHIFT function is disabled. The SHIFT function can also be disabled by waiting for a time-out of 2 seconds after being pressed.

By pressing the <SHIFT> key followed by the <RIGHT ARROW> key, the graphic display's contrast increases to the allowed maximum, and then returns to 0 value.

NUMERIC KEYS: allow the entry and display of the main numeric symbol. If the <SHIFT> has first been pressed, the choice of alternative alphabetic characters will be activated.

BACKSPACE KEY: deletes the last character entered.

SPACE KEY: allows the introduction of a blank space. If the <SHIFT> has been pressed previously, the choice of alternative characters will be activated.

ENTER KEY: allows validation of what has been typed.

RESET: by pressing <SCAN> + <ON/OFF> keys simultaneously, a system reset is performed.

3.7   STATUS INDICATORS

3.7.1   LED Status

The Formula™ provides four different LEDs signaling the mobile computer status.

LED	STATUS	
Good Read and General Purpose (left side)	Green	It is constant for a configurable time to signal that a successful read has occurred.
	Green/Red	It is also available to the application program.
Charging Status (right side)	Green constant	It is constant once the charging process has been completed.
	Red constant	It is constant while charging.
Radio Status (on the upper left side of the arrow keys)	Blue	It blinks once Radio Bluetooth status is active.
Application Programmable Status (on the upper right side of the arrow keys)	Orange	User programmable LED

3.7.2 Taskbar

The Taskbar provides information about the time, the battery level, the keyboard function, and the decoding status.
The first row of the display is used to manage the taskbar and can display the following icons:

ICONS	DESCRIPTION
88:88	Time icon
▱	Battery icon. Displays battery charge status
✉	Mail icon
▮	Transmission icon
☎	Phone icon
🔔	Bell icon
✳	Bluetooth icon
⟿	USB icon
▯	MMC/SD icon
⊏	DC-IN icon
⚿	KEY icon

NOTE

Use and display of all icons can be controlled directly by application program, except for battery icon, time icon and DC-IN icon that are controlled directly by operating system.

4 MAINTENANCE

NOTE	*Rechargeable backup batteries and battery packs are not initially charged. Therefore the initial operation to perform is to charge them. See below.*

CAUTION	*By default, the backup battery is disconnected at the factory to avoid damage due to excessive draining. If it is not connected (through the backup battery switch) and subsequently charged together with the battery pack, all data will be lost when changing the battery pack. Annual replacement of rechargeable battery pack avoids possible risks or abnormalities and ensures maximum performance.*

4.1 CONNECTING THE BACKUP BATTERY

The backup battery must be connected by putting the switch in the "connected" position. It will be charged together with the battery pack through the normal charging process.
It is only necessary to disconnect the backup battery if it will not be used for a long period of time (i.e. several weeks).

CAUTION	*Be careful when using sharp-edged tools to move the switch from the "disconnected" position to the "connected" position and vice versa!*

4.2 CHARGING THE BATTERY PACK

The battery pack autonomy varies according to factors such as the frequency of barcode scanning, RF usage, etc.

The battery icon on the Taskbar indicates when the battery pack is low.

It is possible to recharge the battery pack by connecting the power supply directly to the Formula™.

Alternatively, it is also possible to recharge the battery pack by using the Formula™ single cradle.

During the charging process the LED positioned at the right side of the display is red constant. Once the charging process has been completed this LED is green constant (see par. 3.7).

If the battery pack is removed from the mobile computer, it can be recharged by inserting it into the rear slot of the Formula™ single cradle.

> **NOTE**
>
> *The battery pack autonomy varies according to many factors, such as the frequency of barcode scanning, RF usage, battery life, storage, environmental conditions, etc.*

> **CAUTION**
>
> *If the battery pack is new or has not been recharged for a long time, it is necessary to perform two or three charging and discharging cycles (complete use) before it can reach its maximum charge capability.*
>
> *The maximum time required to recharge a completely run-down battery pack is about 3 hours if the mobile computer is idling.*

> **NOTE**
>
> *Even if the storage temperature range is wider, In order to achieve the longest battery life, store the terminal and the spare batteries between 20 to 30 °C (68 to 86 °F).*
>
> *The Batteries must be charged at a temperature ranging from 0° to +45 °C (+32° to +113 °F).*

4.3 REPLACING THE BATTERY PACK

To correctly replace the battery pack, proceed as follows.

1. Turn off the Formula™.

2. Use a screw driver to rotate the battery cover screw to the vertical position, then push the battery clips in, as indicated in the figure below. The battery pack cover is now released.

3. Remove the cover and then the battery pack.

Battery Contacts

4. Install the new battery pack, first insert the bottom (contacts) side, then the upper (lock) side as indicated in the following figure:

5. For correct locking, push the battery clips outwards and rotate the screw to the horizontal position.

WARNING

To install, charge and/or do any other action on the battery, follow this manual.

The battery pack may get hot, explode, ignite, and/or cause serious injury if exposed to abusive conditions.

If the battery pack is replaced with an improper type, there is risk of explosion.

Do not place the battery pack in or near a fire or heat; do not place the battery pack in direct sunlight, or use or store the battery pack inside unventilated areas in hot weather; do not place the battery pack in microwave ovens, dryer, high pressure containers, on induction cookware or similar device. Doing so may cause the battery pack to generate heat, explode or ignite. Using the battery pack in this manner may also result in a loss of performance and a shortened life expectancy.

Use only a Datalogic Mobile approved power supply. The use of an alternative power supply will void the product warranty, may cause product damage and may cause heat, explode or ignite.

The area in which the units are charged should be clear of debris and combustible materials or chemicals.

Do not use the battery pack of this terminal for power devices different from this mobile computer.

Immediately discontinue use of the battery pack if, while using, charging or storing the battery pack, the battery pack emits an unusual smell, feels hot, changes colour or shape, or appears abnormal in any other way.

Do not short-circuit the battery pack contacts connecting the positive terminal and negative terminal. This might happen, for example, when you carry a spare battery pack in your pocket or purse; accidental short–circuiting can occur when a metallic object such as a coin, clip, or pen causes direct connection of the contacts of the battery pack (these look like metal strips on the battery pack). Short–circuiting the terminals may damage the battery pack or the connecting object.

Do not apply voltages to the battery pack contacts.

Do not pierce the battery pack with nails, strike it with a hammer, step on it or otherwise subject it to strong impacts or shocks.

Do not disassemble or modify (i.e. bend, crush or deform) the battery pack. The battery pack contains safety and protection devices, which, if damaged, may cause the battery pack to generate heat, explode or ignite.

WARNING

In case of leakage of liquid from the battery, avoid contact with liquid the skin or eyes. If the contact occurs, immediately wash the affected area with water and consult a doctor.

Do not solder directly onto the battery pack.

Do not expose the battery pack to liquids.

Avoid any knocks or excessive vibrations. If the device or the battery is dropped, especially on a hard surface, you should take it to the nearest Authorised Repair Centre for inspection before continuing to use it.

Do not replace the battery pack when the device is turned on.

Do not remove or damage the battery pack's label.

Do not use the battery pack if it is damaged in any part.

Battery pack usage by children should be supervised.

Collect and recycle waste batteries separately from the device in comply with European Directive 2006/66/EC, 2002/95/EC, 2002/96/EC and subsequent modifications, US and China regulatory and others laws and regulations about environment.

NOTE

In order to guarantee an adequate operating autonomy, when replacing the battery pack the mobile computer checks the battery energy level. If the battery is not sufficiently charged, Formula™ does not turn on (when pressing the ON/OFF key).
In this case, either substitute the battery pack with a charged one (sufficiently charged) or insert Formula™ into a powered cradle or plug it into the direct power supply.

If alkaline batteries are used, the operating autonomy may vary according to operating conditions and battery manufacturer.

NOTE

To achieve the best battery life, turn off the radios not in use.

4.4   CLEANING THE MOBILE COMPUTER

Periodically clean the Formula™ with a slightly dampened cloth.
Do not use alcohol, corrosive products or solvents.

5 TROUBLESHOOTING

PROBLEM	CAUSE	REMEDY
When the <SCAN> button is pressed the terminal does not come on.	Flat batteries.	Recharge terminal.
	Batteries completely flat or broken.	Replace batteries.
When the <SCAN> button is pressed, the terminal displays the message BATTERY LOW and switches itself off.	Flat batteries.	Recharge terminal.
	Batteries completely flat or broken.	Replace batteries.
The terminal does not load the application program.	You are downloading via serial communication and the serial cable is not correctly connected.	Check the serial connection on the terminal or on the cradle and the serial port of the host.
	You are downloading via USB communication and the USB cable is not correctly connected.	Check the USB connection on the terminal or on the cradle and the USB port of the host.
	You are downloading via MMC/SD.	Check if card is: -Correctly inserted -FAT16 formatted -The file to download is present on the card with the correct filename and extension. File name must be DS_OUT. File extension is .HEX in case of single bank application or .HXX in case of a multi-bank application.
	The terminal already contains an application program.	Follow instructions to cancel the application.

PROBLEM	CAUSE	REMEDY
The terminal displays an error message FAULT CODE.P21CO4.	The application loaded is not suitable for the terminal in use. The terminal displays the message FAULT CODE P21CO4.	Load the correct application program.
	Other faults. The terminal displays an error message other than FAULT CODE P21 CO4.	Contact your Datalogic Mobile representative for technical assistance.

6　TECHNICAL FEATURES

6.1　TECHNICAL DATA

Formula™ Common Features

Electrical Features	
Power	
DC Supply	5 V ± 5%
Battery Pack	1 cell Li-Ion 1000 mAh@3.7 V (nominal) Alternatively 1 cell Li-Ion 2000 mAh@3.7 V (nominal)
Internal Backup Battery	Rechargeable Ni-MH 15mAh@.2.4 V
Communication Features	
Bluetooth Interface	SPP Profile on COM defined by host
Serial Interface	RS232 USB 1.1
Environmental Features	
Working Temperature*	0° to +50 °C / 32 °F to +122 °F
Storage Temperature	-20° to +70 °C / -4° to +158 °F
Humidity**	10 to 80% non condensing for temperatures < 38 °C
Protection	IP 54
ESD Protection	4 KV contact discharge, 8 KV air discharge
Drop Resistance***	1.2 m / 3 ft 9 in
Hardware Features	
FLASH	512 KB
RAM	1 MB
Microprocessor	8-bit CMOS
Audio	Beeper
LEDs	Two-color Good Read/Programmable Charging Status Radio Status Application Programmable Status
Display	FSTN Transflective 2.2" B/W LCD with LED backlight, 16 lines by 16 characters, antiglare and antiscratch protection
Keyboard	25 Plastic Top + lateral ON/OFF key
Mechanical Features	
Dimensions (LxWxH)	15.2 x 5.5 x 4.0 cm / 5.9 x 2.2 x 1.6in
Weight (depending on model)	206 g / 7.27 oz (incl. 1000 mAH battery) 226 g / 7.97 oz (incl. 2000 mAH battery)

*　　Battery must be charged at a temperature ranging from 0° to +45 °C.

　　Close to the limits of the working temperature, some display and/or battery performance degradation may occur.
**　Multiple rapid humidity and/or temperature variations may cause condensing.
***　Multiple drops can permanently damage the device.

Programming Features	
Operating System	Proprietary
Operating Modes	Bootstrap loader; application program
Laser Models	
Decoded barcodes TBD	Standard 3/9
	Extended 3/9
	Italian pharmaceutical
	Interleaved 2/5
	ITF 14
	Industrial 2/5
	Matrix 2/5
	UPC - EAN
	UPC only
	UPC/EAN + Addon 2
	UPC/EAN + Addon 5
	UPC-E only
	UPC 8 only
	UPC-A & EAN 13 only
	Codabar (NW7)
	Monarch (2/7)
	PAKO
	Code 128
	EAN 128
	Delta A IBM
	MSI
	Code 93
	Zellweger
	Storagetek
	GS1 Databar Omnidirectional
	GS1 Databar Expanded
	GS1 Databar Limited

Formula™ Laser Optical Features

Laser Optical Features	
	DL-FORMULA™ LASER **DL-FORMULA™ BT LASER**
Maximum resolution	0.10 mm / 4 mils
Skew angle	± 50°
Pitch angle	± 65°
Scan rate - bidirectional	104 ± 12 scan/sec
Light source laser scanner	VLD, wavelength 630~680 nm
Safety class	Class II EN 60825-1/CDRH

6.2 READING DIAGRAM

DL Formula™

Typical Reading Diagram - Reading Zones (10° skew angle)

0,37 mm (*15 mils*)

0,25 mm (*10 mils*)

0,16 mm (*6 mils*)
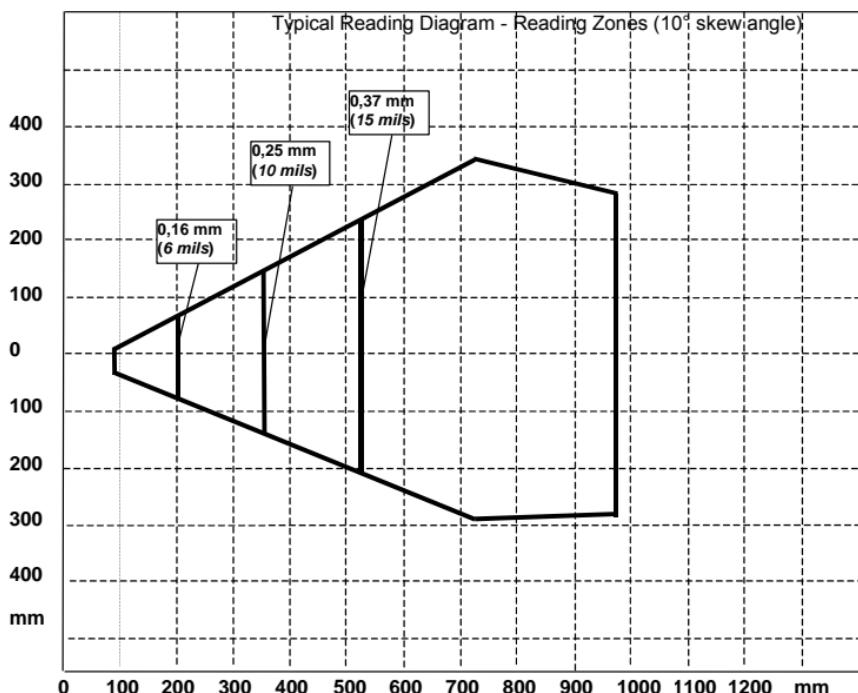
7 TEST CODES

High Density Codes

0.25 mm (10 mils)

Code 39

17162

2/5 Interleaved

0123456784

Code 128

test

80%

EAN 13

8 012345 000012

80%

EAN 8

6450 9723

Medium Density Codes

<u>0.38 mm (15 mils)</u>

Code 39

17162

Interleaved 2/5

0123456784

Code 128

test

<u>100%</u>

EAN 13

8 012345 000012

<u>100%</u>

EAN 8

6450 9723

Low Density Codes

<u>0.50 mm (20 mils)</u>

Code 39

17162

Interleaved 2/5

0123456784

Code 128

test

<u>120%</u>

EAN 13

8 012345 000012

<u>120%</u>

EAN 8

6450 9723

GLOSSARY

Barcode

A pattern of variable-width bars and spaces which represents numeric or alphanumeric data in binary form. The general format of a barcode symbol consists of a leading margin, start character, data or message character, check character (if any), stop character, and trailing margin. Within this framework, each recognizable symbology uses its own unique format.

Baud Rate

A measure for data transmission speed.

Bit

Binary digit. One bit is the basic unit of binary information. Generally, eight consecutive bits compose one byte of data. The pattern of 0 and 1 values within the byte determines its meaning.

Bluetooth®

A standard radio technology using a proprietary protocol. The onboard Bluetooth module in the mobile computer is compatible with the 1.1 protocol.

Byte

On an addressable boundary, eight adjacent binary digits (0 and 1) combined in a pattern to represent a specific character or numeric value. Bits are numbered from the right, 0 through 7, with bit 0 the low-order bit. One byte in Formula™ can be used to store one ASCII character.

Decode

To recognize a bar code symbology *(e.g.,* Codabar, Code 128, Code 3 of 9, UPC/EAN, etc.) and analyze the content of the bar code scanned.

EEPROM

Electrically Erasable Programmable Read-Only Formula™. An on-board non-volatile Formula™ chip.

Flash Disk

Non-volatile Formula™ for storing application and configuration files.

Host

A computer that serves other mobile computers in a network, providing services such as network control, database access, special programs, supervisory programs, or programming languages.

Liquid Crystal Display (LCD)

A display that uses liquid crystal sealed between two glass plates. The crystals are excited by precise electrical charges, causing them to reflect light outside according to their bias. They use little electricity and react relatively quickly. They require external light to reflect their information to the user.

Light Emitting Diode (LED)

A low power electronic light source commonly used as an indicator light. It uses less power than an incandescent light bulb but more than a Liquid Crystal Display (LCD).

RAM

Random Access Formula™. Data in RAM can be accessed in random order, and quickly written and read.

RF

Radio Frequency.

RTC

Real Time Clock.

Terminal

A Datalogic portable computer product.

INDEX

Datalogic Mobile S.r.l.
Via S. Vitalino, 13
40012 - Lippo di Calderara
Bologna - Italy

$C \epsilon$ 08

dichiara che
declares that the
déclare que le
bescheinigt, daß das Gerät
declare que el

DL-FORMULA™ BT LASER

e tutti i suoi modelli
and all its models
et tous ses modèles
und seine Modelle
y todos sus modelos

sono conformi alle Direttive del Consiglio Europeo sottoelencate:
are in conformity with the requirements of the European Council Directives listed below
sont conformes aux spécifications des Directives de l'Union Européenne ci-dessous:
der nachstehend angeführten Direktiven des Europäischen Rats:
cumple con los requisitos de las Directivas del Consejo Europeo, según la lista siguiente:

1999/5/EEC R&TTE

Questa dichiarazione è basata sulla conformità dei prodotti alle norme seguenti:
This declaration is based upon compliance of the products to the following standards:
Cette déclaration repose sur la conformité des produits aux normes suivantes:
Diese Erklärung basiert darauf, daß das Produkt den folgenden Normen entspricht:
Esta declaración se basa en el cumplimiento de los productos con la siguientes normas:

ETSI EN 301 489-17 v1.2.1, AUGUST 2002: ELECTROMAGNETIC COMPATIBILITY AND RADIO SPECTRUM MATTERS (ERM); ELECTROMAGNETIC COMPATIBILTY (EMC) STANDARD FOR RADIO EQUIPMENT AND SERVICES; PART 17: SPECIFIC CONDITIONS FOR 2,4 GHZ WIDEBAND TRANSMISSION SYSTEMS AND 5 GHZ HIGH PERFORMANCE RLAN EQUIPMENT

ETSI EN 300 328 v1.7.1, OCTOBER 2006: ELECTROMAGNETIC COMPATIBILITY AND RADIO SPECTRUM MATTERS (ERM); WIDEBAND TRANSMISSION SYSTEMS; DATA TRANSMISSION EQUIPMENT OPERATING IN THE 2,4GHZ ISM BAND AND USING WIDE BAND MODULATION TECHNIQUES; HARMONIZED EN COVERING ESSENTIAL REQUIREMENTS UNDER ARTICLE 3.2 OF THE R&TTE DIRECTIVE

EN 60950-1, DECEMBER 2001: INFORMATION TECHNOLOGY EQUIPMENT - SAFETY - PART 1 : GENERAL REQUIREMENTS

EN 50371:2002 GENERIC STANDARD TO DEMONSTRATE THE COMPLIANCE OF LOW POWER ELECTRONIC AND ELECTRICAL APPARATUS WITH THE BASIC RESTRICTIONS RELATED TO HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS (10 MHZ - 300 GHZ) – GENERAL PUBLIC.

Lippo di Calderara, December 15th, 2008

Paola Chientaroli

Paola Chientaroli
Quality Assurance Manager

Datalogic Mobile S.r.l.
Via S. Vitalino, 13
40012 - Lippo di Calderara
Bologna - Italy

$\mathsf{C}\,\mathsf{E}$ 08

dichiara che
declares that the
déclare que le
bescheinigt, daß das Gerät
declare que el

DL-FORMULA™ LASER

e tutti i suoi modelli
and all its models
et tous ses modèles
und seine Modelle
y todos sus modelos

sono conformi alle Direttive del Consiglio Europeo sottoelencate:
are in conformity with the requirements of the European Council Directives listed below
sont conformes aux spécifications des Directives de l'Union Européenne ci-dessous:
der nachstehend angeführten Direktiven des Europäischen Rats:
cumple con los requisitos de las Directivas del Consejo Europeo, según la lista siguiente:

89/336/EEC EMC Directive	e	**92/31/EEC, 93/68 /EEC**	emendamenti successivi
	and		further amendments
	et		ses successifs amendements
	und		späteren Abänderungen
	y		succesivas enmiendas

Basate sulle legislazioni degli Stati membri in relazione alla compatibilità elettromagnetica ed alla sicurezza dei prodotti.
On the approximation of the laws of Member States relating to electromagnetic compatibility and product safety.
Basée sur la législation des Etats membres relative à la compatibilté électromagnétique et à la sécurité des produits.
Über die Annäherung der Gesetze der Mitgliedsstaaten in bezug auf elektromagnetische Verträglichkeit und Produktsicherheit entsprechen.
Basado en la aproximación de las leyes de los Países Miembros respecto a la compatibilidad electromagnética y las Medidas de seguridad relativas al producto.

Questa dichiarazione è basata sulla conformità dei prodotti alle norme seguenti:
This declaration is based upon compliance of the products to the following standards:
Cette déclaration repose sur la conformité des produits aux normes suivantes:
Diese Erklärung basiert darauf, daß das Produkt den folgenden Normen entspricht:
Esta declaración se basa en el cumplimiento de los productos con la siguientes normas:

EN 55022 (CLASS B ITE), SEPTEMBER 1998:

INFORMATION TECHNOLOGY EQUIPMENT
RADIO DISTURBANCE CHARACTERISTICS
LIMITS AND METHODS OF MEASUREMENTS

EN 55024, SEPTEMBER 1998:
AMENDMENT A1, OCTOBER 2001
AMENDMENT A2, JANUARY 2003

INFORMATION TECHNOLOGY EQUIPMENT
IMMUNITY CHARACTERISTICS
LIMITS AND METHODS OF MEASUREMENT

Lippo di Calderara, December 15th , 2008

Paola Chientaroli
Paola Chientaroli
Quality Assurance Manager

✦DATALOGIC™

www.mobile.datalogic.com

World wide Sales Network
available from: www.mobile.datalogic.com/contacts

Datalogic Mobile S.r.l.
Via S. Vitalino, 13
40012 Lippo di Calderara di Reno
Bologna - Italy
Telephone: (+39) 051-3147011
Fax: (+39) 051-3147561